TRINITY RIVER WILLOW FLYCATCHER SURVEYS 1990-1992

FINAL REPORT - PREPARED FOR:

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INTRODUCTION

The willow flycatcher was once a common breeding bird in suitable habitat throughout California (Grinnell and Miller 1944). Formerly, this species was locally common in riparian woodlands of the Central Valley as well as in high mountain meadows of the Sierra Nevada. However, due to destruction of willow riparian habitat and nest parasitism by the brown-headed cowbird, this species has undergone drastic population declines (Gaines 1974, 1977). Today, it has apparently been extirpated from all known localities in the Central Valley. The Sierra Nevada were surveyed in 1981 and only 72 singing males were located (Serena 1982). In June 1990, the willow flycatcher was listed as endangered in the state of California due to continuing declines in numbers and habitat.

Since 1981 several studies of the willow flycatcher have taken place in California in an attempt to determine both the numbers and distribution of birds, as well as their habitat requirements. Willow flycatchers are known to be associated with riparian habitat, particularly willows, (Salix sp.) (Grinnell and Miller 1944), preferring a clumped, noncontiguous distribution (Sanders and Flett 1989). Willow cover of 50-70% is thought to be optimal (Kings River Conservation District 1987, Sanders and Flett 1989). Average territory size in California is reported from 0.2 ha to 0.34 ha with a range of 0.056 ha to 0.89 ha (Kings River Conservation District 1987, Sanders and Flett 1989). Occurrence is linked to standing or running water. Indications are that streams > 1.2 m (4 ft) in width are more likely to support willow flycatchers, as are meadows that are at least 40% wet (Harris et. al. 1987). Meadows 16 ha or larger seem to be more likely to support willow flycatchers than small meadows or other riparian systems (Sanders et al. 1986).

Willow flycatchers typically nest in willows one to two meters off the ground, a meter from the top of the foliage, and about two meters in from the edge of the foliage (Bent 1963, Ehrlich et al. 1988, Sanders and Flett 1989). Cup nests are built by interweaving material between several vertically oriented supports with loose debris hanging from the underside. Average foliage density around the nest is approximately 70%, ranging from 10%-90% (Sanders and Flett 1989). Because of the combined preference for low nest locale and dense cover, willow-grazing cattle can heavily impact nesting habitat.

Several factors have contributed to the decline of willow flycatchers. A primary factor has been habitat loss due to development and cattle grazing. Additionally, brown-headed cowbird parasitism is an important factor. Finally, low egg to fledgling success has been documented, without however, understanding the reasons for the low success rate (Sanders and Flett 1989). Egg shell thinning has been eliminated as a cause at some locations (Kings River Conservation District 1987).

OBJECTIVES

The goal of this project was to determine the breeding status of the willow flycatcher along the Mainstem and South Forks of the Trinity River, and if present, to design a management plan for this State-listed endangered species. This was achieved by first determining presence and distribution along each river. All suitable habitat (willow dominant) was surveyed along a section of the Mainstem and the lower South Fork. The second step was to determine reproductive status. Singing males' territories were mapped and nests were to be located when pairing was confirmed. The third objective was to determine willow flycatcher reproductive success. If found, nests were to be monitored from discovery to fledging of young.

Once the above objectives were met, a long term management strategy for preservation and enhancement of this species along the Trinity River could be formulated. All vegetation along this 39 mile section of the Mainstem Trinity River was mapped to determine how much potential habitat exists (Wilson 1993).

STUDY AREA

Mainstem Trinity River

Our study area encompassed a 39 mile (63 km) stretch of the Mainstem Trinity River from below Lewiston Dam down river to the confluence with the North Fork of the Trinity River (hereafter called Mainstem), in Trinity County, California (Fig. 1). Sixty percent of the land adjacent to the river along this stretch is managed by the Bureau of Land Management. The majority of the remainder is privately owned, with a small portion belonging to the Shasta-Trinity National Forest (USDA Forest Service). The elevation of the river ranges between 1378 and 1804 feet (420 and 550 meters).

We divided the river into 16 unequal length segments (hereafter called Reaches) averaging 1.95 miles (3.14 km) in length which were determined by boat launch access (Fig. 1). Actual length varied between 1.5 and 2.5 miles (2.41 and 4.02 km).

The dominant canopy tree species include white alder (Alnus rhombifolia), yellow willow (Salix lasiandra), and rarely Fremont cottonwood (Populus Fremontii), or black cottonwood (P. trichocarpa). Sub-canopy tree and shrub species include sand-bar willow (Salix hindsiana), and Salix melanopsi. Understory species include salmonberry (Rubus spectabilis), sedges (Carex spp.), rushes (Juncus spp.), horsetail (Equisetum arvense), and various annuals. Evans (1980) defined four broad habitat types within the riparian zone: (1) bare rock or gravel bar, (2) willow dominant, (3) willow-alder mix and, (4) mature alder-cottonwood. The width of the riparian zone varies from 5 m to 50 m wide. The oldest and most mature riparian areas are closest to the dam because of the controlled flows and lack of flooding. Further downstream, tributary streams

contribute variable flows and create periodic flooding, resulting in some younger riparian vegetation. Mining tailings are extensive along the lower third of the Mainstem study area; some with scattered willows, and others barren of vegetation. Humans inhabit many areas along the floodplain, probably affecting wildlife community composition, distributions, and movements. The associated upland habitat may be categorized as montane hardwood-conifer on north facing slopes and montane hardwood on south facing slopes (Mayer and Laudenslayer 1988).

South Fork Trinity River

On this river fork, we surveyed the lower 14 miles (23 km) from Surprise Creek to the confluence with the Mainstem Trinity River in Humboldt and Trinity Counties, California (hereafter called South Fork). The river was divided into 5 reaches that were each 2-3 miles long, also determined by boat launch access (Fig. 2). The riparian vegetation community is similar in content to the Mainstem, but there is much less vegetation in the immediate vicinity of the river along the South Fork. Upland slope vegetation was also similar to the Mainstem. In addition to riverine vegetation, small sections of 2 creeks were also surveyed: (1) the lower 2 miles of Willow Creek, a tributary to the Mainstem Trinity approximately 7 miles downstream of the South Fork confluence and (2) Grove's Prairie, in the Cedar Creek drainage, also a tributary to the Mainstem below the South Fork Confluence. Elevation at these sites ranged from 500 to 800 feet (152-244m) at the South Fork and Willow Creek and was approximately 3500 feet (1067m) at the Grove's Prairie site. The majority of the survey area was on the Six Rivers National Forest (USDA Forest Service).

METHODS

Mainstem

In 1990, we conducted general wildlife habitat surveys of the 39 mile river section described above. These surveys included bird censusing and although willow flycatchers were not specifically targeted several were detected. These results are summarized in this report and elsewhere (Wilson et. al. 1991). Our first detection of willow flycatchers in the 1990 season was May 24 (Wilson et al. 1991), so surveys during 1991 and 1992 began during the first week of June. Our primary surveys (described below) was similar during 1991 and 1992. Secondary surveys differed between the two years.

1991-92 Primary Surveys

Our initial surveys for willow flycatchers began the first week of June and lasted approximately 2 weeks. We made one pass of the entire 39 miles, surveying each of the 16 reaches. Survey stations were systematically spaced along the river at 250 m intervals (see Wilson et al. 1991). These were used to survey for willow flycatchers. Based on our detection experience during 1990, we estimated that on average, a singing willow flycatcher could be heard at a distance of 100 meters. This would mean that we might miss 50 m to 100 m between survey stations. We listened very attentively while kayaking between stations. Our surveys began at dawn.

Not all stations were surveyed in our study area. Detections of willow flycatchers during the 1990 season were all in willow dominant riparian vegetation. The literature (Flett and Sanders 1987, Sanders et al. 1987, and Serena 1982), as well as our data from 1990 and 1991 (Wilson et al. 1991 and

Lind et al. 1992, respectively), indicates that willow flycatchers are very habitat specific, and prefer willow dominant vegetation. We concentrated our survey efforts during 1991 and 1992 in willow dominant and willow/alder habitat. This was easily identified from aerial photos as well as by boat in the field. All survey stations were identified as being willow dominant vegetation (>2/3), alder dominant (>2/3), or willow/alder mix. We surveyed all the willow and willow/alder stations on each Reach. Alder dominant stations were not surveyed. However, the crew member not censusing floated very slowly through these sections listening for willow flycatchers.

A survey went as follows. Each censuser stood at the station and recorded three kinds of data within a 5 minute period: (1) the number of willow flycatchers detected, (2) the number of birds (all species) detected within a 25m-radius surrounding the observer, (3) the number of birds (all species) detected beyond the 25m-radius circle but still within riparian vegetation. Two Reaches were surveyed each day between 0600 and 1030 hours; with all 16 Reaches completed in two weeks.

1991 Secondary Surveys

Three additional surveys took place on those Reaches where willow flycatchers were located during the first pass (June 1991), and those Reaches where willow flycatchers were detected during the 1990 wildlife studies (Wilson et al. 1991). A more intensive survey took place during these second and third passes. Additional survey stations were located half-way between those that already existed (125-175 m apart). With an average detection distance of 100 m, this enabled us to survey the entire Reach.

1992 Secondary Surveys

Two additional surveys took place on those Reaches where willow flycatchers were located during the first pass (June 1992), and those Reaches where willow flycatchers were detected during the 1990 and 1991 wildlife studies (Wilson et al. 1991 and Lind et al. 1992, respectively). A more intensive survey took place during these second and third passes. Identical to secondary surveys of 1991, additional survey stations were located half-way between those that already exist.

Reproductive Status

For those willow flycatchers located during the surveys, an effort was made to determine the bird's reproductive status. This involved observing the birds (45 minutes to 1 hour) to document pairing and subsequent reproductive effort (i.e. nest building). Territorial singing birds were visited at least once a week from mid-June to mid-July, or until they were no longer present.

South Fork

During the third week of June 1992, we surveyed the lower 14 miles of the South Fork of the Trinity River. Aerial photos were xeroxed and used in the field to identify potential habitat to be surveyed. Two individuals kayaked approximately 7 miles on 2 successive days (covering all Reaches); stopping wherever willow vegetation occurred to listen for willow flycatchers. The lower 2 miles of Willow Creek (near the town of Willow Creek) and the Groves Prairie area were also surveyed. The lower mile of Willow Creek has extensive willow

vegetation and looked to be potential habitat for this species. One day was spent at each of these areas and they were surveyed by walking slowly through riparian vegetation and listening for singing or calling willow flycatchers.

RESULTS

Mainstem

1990

Willow flycatchers were detected approximately 20 times on reaches 2,3,14, 15,16 (Fig. 1). These were primarily singing males in early successional, willow-dominated, vegetation. Their distribution appeared to be clumped; most of the individuals were located in three sections of the river. Direct evidence of breeding was not confirmed. However, along one stretch of river (Reach 2, across from a gravel operation), six males were detected evenly spaced and counter-singing, indicating territorial behavior and indirect evidence of reproduction. Our 1990 census method was designed to sample the bird community immediately adjacent to the river. Consequently, significant suitable habitat between stations and beyond the censusing radius was not surveyed.

1991

Survey 1 - This first survey of all 16 Reaches took place between June 5 and June 14, 1991. A total of 8 willow flycatchers were detected on three Reaches during this two week period. Each will be described below (Fig. 3).

Reach 2 - One singing individual was located directly across from the Bureau of Land Management (BLM) fishing access parking lot at Rush Creek. This bird was in a very marshy (cattails) area with willows being the dominant tree/shrub. Another individual was located calling at the Salt Flat bridge. This bird did not sing and was observed foraging in willow clumps adjacent to the Salt Flat side channel.

Reach 4 - Four and maybe five individuals were detected along this Reach (Brown's Mtn. Road to upper end of Poker Bar). One was observed singing in an

extensive willow patch next to the river at the east end of Grass Valley. Another was singing centered in Grass Valley near the willow surrounded ponds next to the river. Two counter-singing willow flycatchers were also seen at the end of Reach 4 (Fig. 3) in an extensive willow patch (approximately 2 ha). This location is at the end of Ponderosa Pines Rd., another BLM fishing access point.

Reach 9 - One singing individual was found at Steiner Flat, using a very wet, marshy area fenced off from cattle and dominated by clumps of willow vegetation.

Survey 2 - Six of the 16 Reaches were surveyed during the week of June 17-21, 1991. Reaches 2-4 were surveyed because willow flycatchers were detected there during the first survey (see above). Reaches 14-16 were also surveyed because willow flycatchers were detected there during June of 1990 (see Wilson et al. 1991).

Reach 2 - Same individual singing at mouth of Rush Creek.

Reach 3 - One individual seen singing in willow dominant vegetation along right side of river at Salt Flat (Fig. 3).

Reach 4 - None detected.

Reach 14 - One seen/heard foraging in willows near gravel operation (just south of Junction City).

Reach 15 and 16 - none detected.

Survey 3 - Reaches 2-4 and 14-16 were surveyed a third time from June 24-28, 1991. Only two willow flycatchers were detected this week. The singing individual was still present on Reach 2 near Rush Creek. Another individual was found at the end of Reach 2 near the Salt Flat side-channel. We spent approximately 1 hour at each location and only one bird was seen at each (no pairs) (Fig. 3).

Survey 4 - On July 8, 1991, we floated Reaches 2-4 looking for willow flycatchers. The same individual was observed on Reach 2 near Rush Creek. This bird was still singing constantly and only one was present. No others were seen or heard. The Steiner Flat location was also checked on July 9, 1991, and no birds were detected.

1992

Survey 1 - This first survey of all 16 Reaches took place between June 2 and June 9, 1992. A total of 4 willow flycatchers were detected on two Reaches during this two week period (Fig. 4). Each will be described below.

Reach 2 - One singing individual was located directly across from the Bureau of Land Management (BLM) fishing access parking lot at Rush Creek. This bird was in a very marshy (cattails) area with willows being the dominant tree/shrub. Another individual was located calling approximately 0.5 km below the Old Lewiston bridge on the right side of the river. This bird was on the edge of the river in dense willow vegetation.

Reach 1 - Two individuals were heard and seen on June 5, 1992 near the fish hatchery just below the Lewistion Dam. They were foraging in willow vegetation near the backwater and pond areas just above the weir. These birds were not seen again during later surveys and were probably migrating through.

Survey 2 - Nine of the 16 Reaches were surveyed again during the week of June 23 to July 1, 1992. Reaches 1-2 were surveyed because willow flycatchers were detected there during the first survey (see above). Reaches 3,4,9 and 13-16 were also surveyed because willow flycatchers were detected there either during June of 1990 or 1991 (see Wilson et al. 1991 and Lind et al. 1992).

Reach 2 - Same individual singing at mouth of Rush Creek (Fig. 4). Two other individuals were seen near Station 10 on the left side of Salt Flat

bridge. These two were foraging in dense willows at the edge of the high water (6000 cfs) mark from the previous week. These two were not seen again.

Reach 3 - None detected.

Reach 4 - None detected.

Reach 9 - None detected.

Reach 13 - None detected.

Reach 14 - None detected.

Reach 15 and 16 - none detected.

Survey 3 - Reaches 1-4 were surveyed a third time from June 25-26, 1991. Only one willow flycatchers was detected this week. The singing individual was still present on Reach 2 near Rush Creek.

South Fork

No willow flycatchers were detected during the 4 days of surveying along the South Fork, along lower Willow Creek, or at Grove's Prairie in the late spring of 1992.

DISCUSSION

Between 10 and 15 willow flycatchers were detected along the Trinity River between Lewiston Dam and the North Fork during June and July of 1991. There was no evidence of breeding. Some Reaches that had willow flycatchers during 1990 (Reaches 15 and 16), had none in 1991. However, Reaches 2, 3, 4, and 14 had willow flycatchers present both during 1990 and 1991 (Figs. 1 and 3).

At least 6 willow flycatchers were detected along the Trinity River between Lewiston Dam and the North Fork during June and July of 1992. There was no evidence of breeding. Some Reaches that had willow flycatchers during 1991 (Reaches 4, 9, and 14) had none in 1992. However, Reaches 2 and 3 had willow flycatchers present during all three years, of 1990-1992 (Figs. 1,3,4).

The fact that no willow flycatchers were found on the South Fork was not surprising. This river is undammed and gets quite regular flood stage flows that scour the riverbanks of vegetation. There was little willow vegetation along the South Fork, and what was there was in very small patches.

One thing is definite, that willow flycatchers use the willow habitat along the river during migration. But, do they breed here ? And if not, could they? Willow flycatcher habitat is characterized by meadow or streamside riparian vegetation, primarily willow (some alder) in clumps. Boggy, moist habitats (presence of standing water) appear to be preferred during breeding season, especially early on. Mosquitoes and other flying insects are also an important component. There appears to be plenty of willow vegetation along the Trinity River. Besides that which grows right along the river, willow often grows away from the river's edge, on the inside of alder corridors. One possible limiting factor in this system may be standing water. The river is very channelized and little water escapes its banks. The flycatchers we detected more than once were

in the wettest locations along the river. The bird near Rush Creek was using a willow/cattail area, with slow moving water and lots of flying insects. The area at Salt Flat in which birds were detected more than once had a newly constructed side-channel running through it. The need for wet areas for breeding probably relates to a need for an abundant food source (flying insects). Slow moving, shallow waters probably produces a greater abundance of flying insects (especially mosquitoes) than either the fast moving main channel or dry land.

Our study failed to show any reproductive activity by willow flycatchers at either the Mainstem or South Fork Trinity study areas. Possible explanations are: (1) drought may have depressed the flying aquatic insect populations enough so that the birds chose not to breed here, and (2) willow flycatcher populations are so depressed throughout the state, that territorial males simply are not able to find mates.

RECOMMENDATIONS

1. Conduct periodic surveys (every other year) during June to determine the status of willow flycatchers along these sections of river.

2. Encourage side-channel projects and bank feathering projects as ways of improving both fisheries habitat and also willow flycatcher habitat on the Mainstem Trinity. These types of projects will be most beneficial for willow flycatchers if they are constructed in areas with high willow densities.

3. Prior to any major construction activity on the river, conduct localized surveys to determine use by willow flycatchers.

4. Monitor side-channel and bank feathering projects for evidence of use by willow flycatchers.

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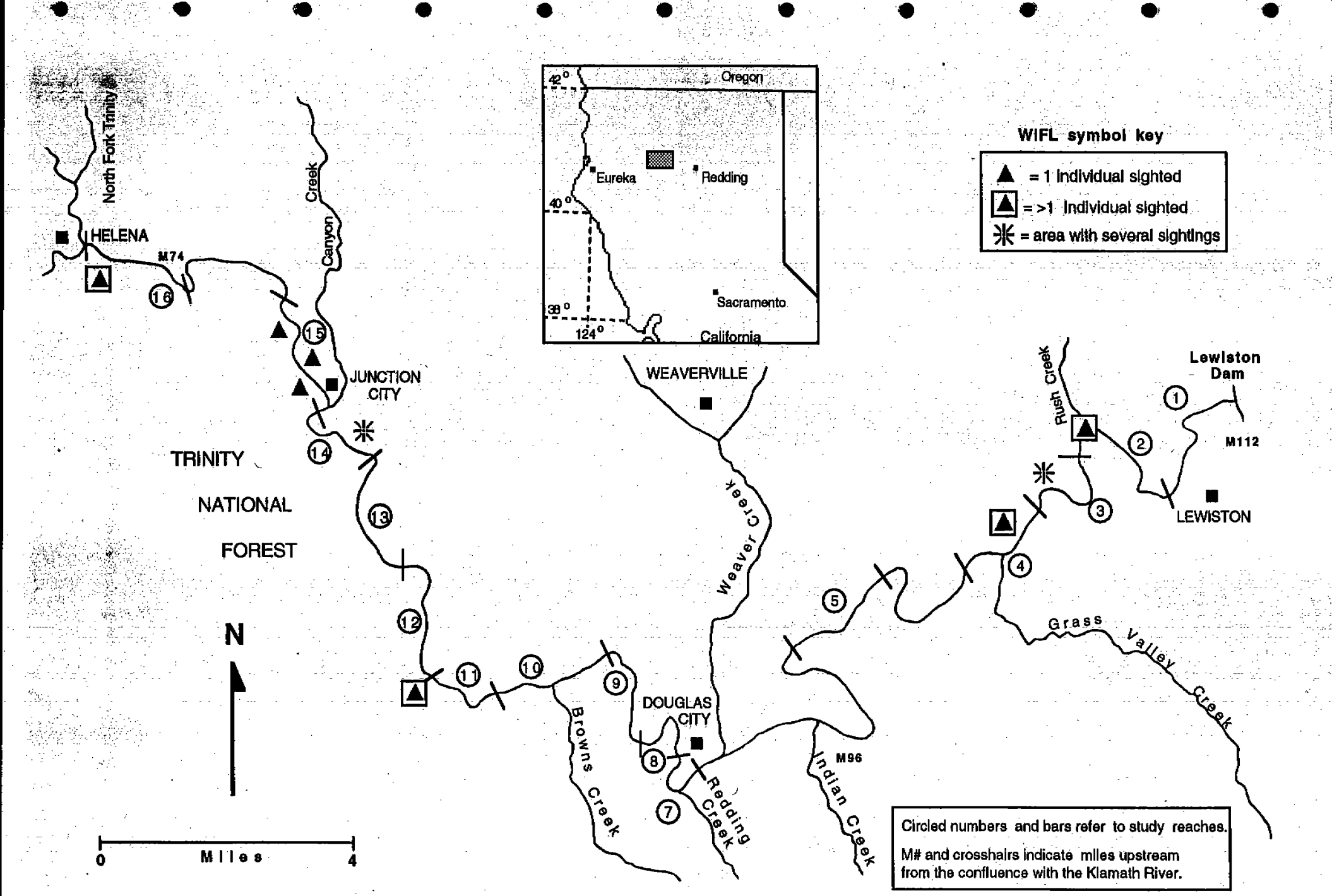

Figure 1. Location of Willow flycatcher sightings along the main fork of the Trinity River, Trinity county, California, 1990.

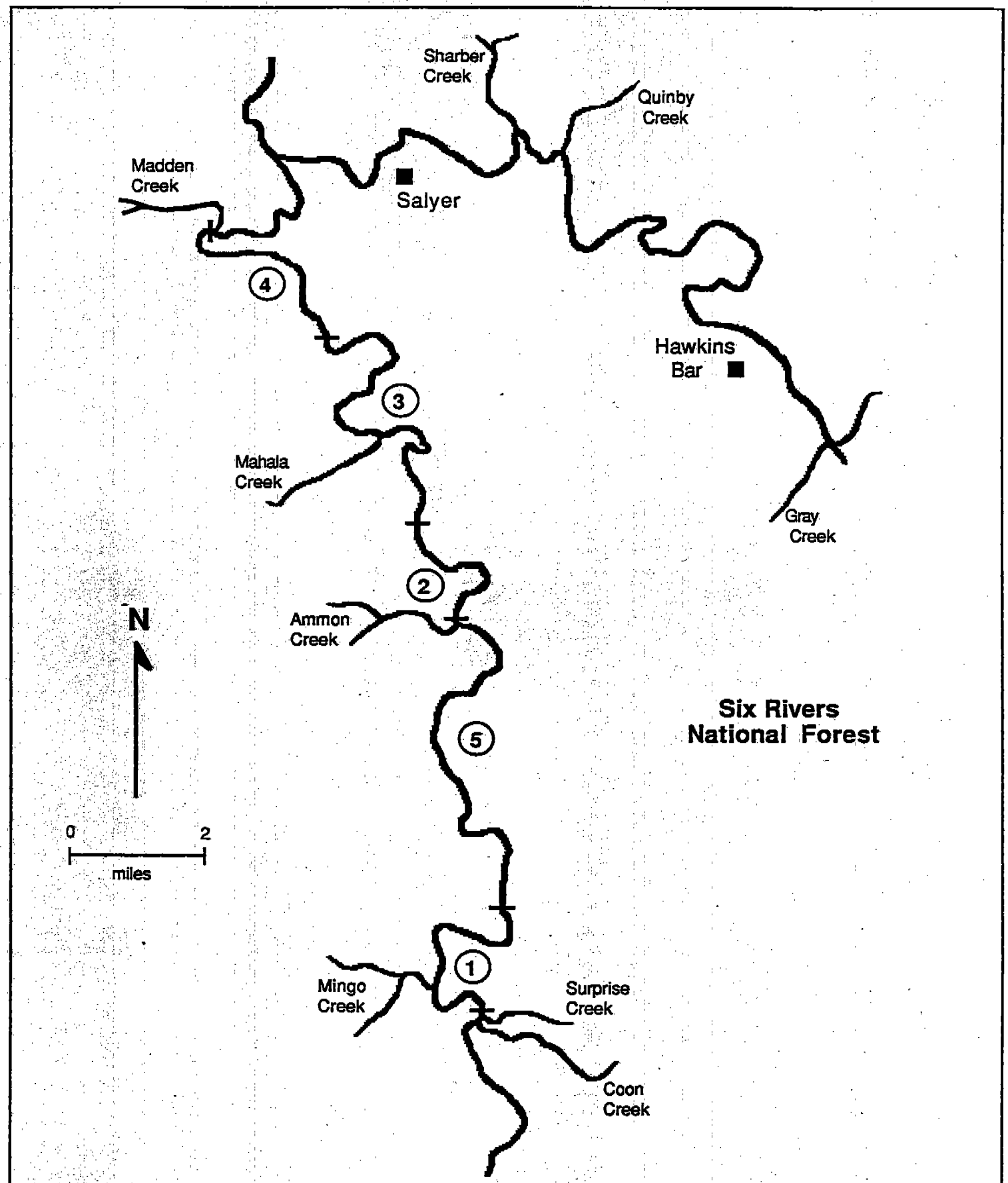

Figure 2. Location of study reaches (circled numbers) along the south fork of the Trinity River, Humboldt and Trinity Counties, California.

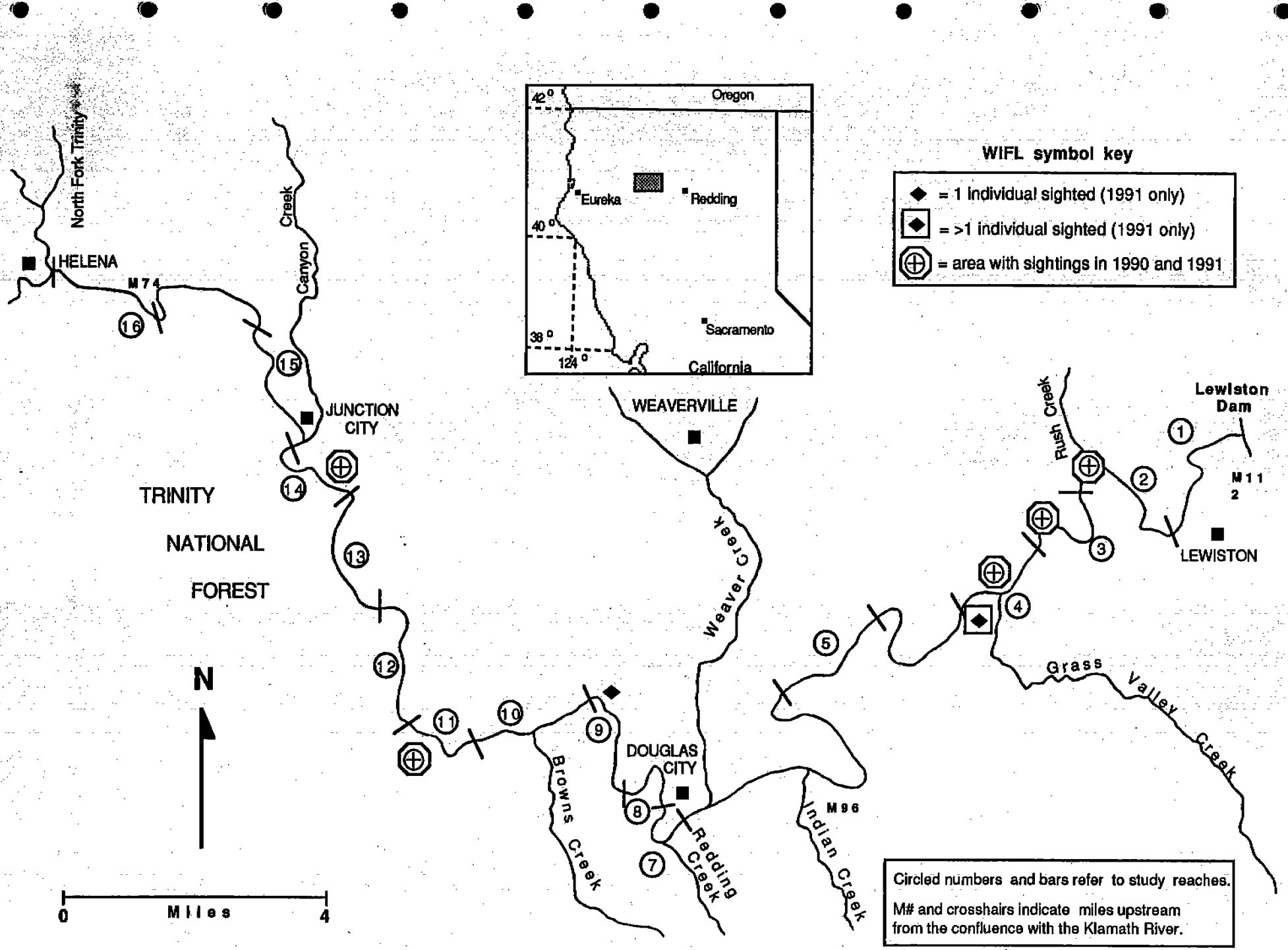

Figure 3. Location of Willow flycatcher sightings along the main fork of the Trinity River, Trinity county, California, 1991.

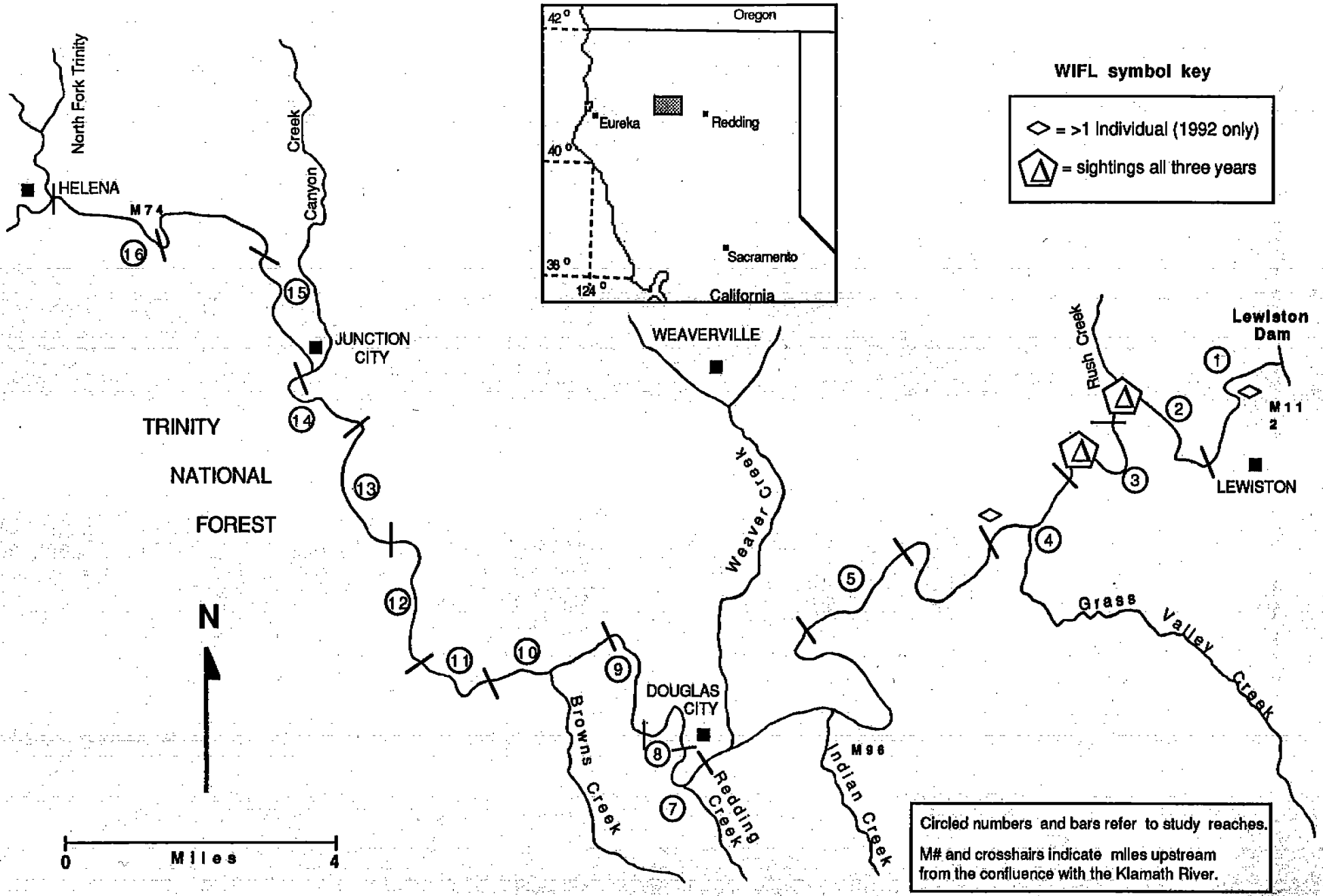

Figure 4. Location of Willow flycatcher sightings along the main fork of the Trinity River, Trinity county, California, 1992.